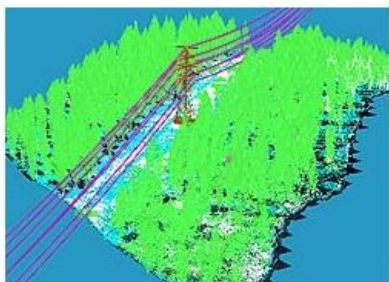


# TILTAN SYSTEMS ENGINEERING

## Photo-realistic 3D Rendering



Nowadays, every child with a home PC has the technology, but in 1993 photo-realistic real-time rendering of geo-specific images was available only to supercomputer users. That same year, Tiltan Systems Engineering was started by retired Israeli military officers. They harnessed state-of-the-art technology to solve a real operational need



Tiltan adapted commercial off-the-shelf computer technology and standard operating systems to create a three-dimensional (3D) visual engine that provided high visual fidelity for presentation of large areas. Nowadays, this technology is used for civilian applications - the majority of Tiltan's work today.

### Rising Company

Since 1993, Tiltan has grown from 30 employees to the current 90 and developed 3D and 2D rendering engines, visual database generation software and mapping capabilities. The mapping capabilities generate GIS information and 3D photo-realistic real-time rendering

display. Tiltan is privately owned by Israel Aerospace Industries, the largest employer in Israel; Matrix IT, the largest IT company in Israel; and the retired Israeli military officers who founded the company. Its corporate philosophy is to provide unparalleled value to its customers via fast and accurate services, from mapping to GIS data delivery and visual data presentation. Focusing on quick reactions and short delivery times, Tiltan developed the capability to automatically process large quantities of Lidar data. The technology was later applied to the TLiD product available today.

### Tiltan in Focus

Tiltan is divided into four primary business units: Simulation and Training; Command and Control; Products; and the Studio. Its specialised Simulation and Training visual systems have been installed worldwide to train those who have to respond well under high pressure, such as police, the military, and disaster management and emergency services teams. The Command and Control systems take advantage of the integration between 2D and 3D capabilities generating intuitive, easy-to-understand situational pictures. One of the products in this arena is SpoTView, which provides a combination of real-time video overlays on computer-generated 3D models of disaster zones, offering rapid orientation and improved situational awareness. This combination of 2D and 3D creates a common language between ground and air participants. The Products unit develops the Lidar processing product and other mapping tools. This unit supports the other business units

with software engines and tools. Lastly, the Studio provides Lidar data-processing services and a 3D visual database generation service to customers and the other business units.

### Automatic Processing

TLiD for automatic [Lidar data processing](#) started at Tiltan as a solution for fast generation of large urban visual databases. It was developed by Tiltan's research and development department in co-operation with the Italian National Institute of Oceanography and Applied Geophysics (OGS). The product was released to the market at the International Lidar and Mapping Forum in 2007 and keeps acquiring new functionality and capabilities in response to customer requests and needs. Because of its existing technologies, Tiltan already had the ability to manipulate and present large quantities of 3D information and handle large digital terrain models. Furthermore, the generation of large urban databases from photogrammetry was an existing technology at Tiltan. Handling the Lidar point clouds and extraction of vectors from these clouds was the only missing building block. The development project was endorsed by Eureka.

### Customer Products

TLiD was developed to optimise and support high-Lidar density. "We agreed that Lidar technology was going in this direction; this approach also enabled us to answer both airborne and terrestrial Lidar data," says Oodi Menaker, Tiltan's product manager. TLiD is sold to Tiltan's customers as a product for their own use; Tiltan also supports its customers with Lidar processing services. This approach enables Tiltan to be the first to use its own product in real production - making sure the product features, functionality and performance completely support a Lidar data production line. TLiD increases production line speed. It is 64-bit and Vista-ready, and takes advantage of multi-core processing. TLiD allows clients to finish in days projects that previously took a month to complete.

## Urban Planning

Processed Lidar data is ideal as a planning and development tool. In areas requiring re-development and general urban planning, TLiD-processed data provides planners with a view of exactly what is already in existence - from trees and power-supply poles to bridges and buildings. Real-time rendering of 3D data enables quick understanding of the real picture for large audiences, even those not trained to read maps and understand area structure.

## Fast Evolution

Lidar and its related processing technology are advancing rapidly. Lidar instruments are becoming a standard tool in engineering and surveying work. As data storage capability grows, computer-processing power is increasing and Lidar-data processing speed ensures that this tool enables the fast generation of accurate 'current survey' maps. "It virtually brings the mapped area into the office," says Menaker, as one can keep taking accurate measures anywhere within the mapped data long after the actual mapping is over.

## LiDAR's Future

Soon, Lidar will be connected to other sensors, such as multi-spectral and RGB (multi-colour) sensors, which will leverage the benefits of each product individually while creating a better global picture. Airborne and terrestrial Lidar, in combination with other sensors, will enable generation of very accurate maps with digital elevation model spacing of 50cm and better, and with accuracies of at most 5cm for all axes. The direct Lidar elevation measurement combined with other sensors will become a key in many remote-sensing applications. The road construction, utility, communication and agriculture industries will all benefit from the combination of Lidar technology and other sensors.

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<https://www.gim-international.com/content/article/photo-realistic-3d-rendering>

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